Claims

1. Method for detecting an analyte in a sample using a luminescent metal complex as a labelling group,
characterized in that
the chemiluminescence of the metal complex is excited by the steps:
(i) oxidizing the metal complex and
(ii) reducing the metal complex by nascent hydrogen to form a form of the metal complex that is capable of chemiluminescing and
(iii) determining the analyte by means of the chemiluminescence.

2. Method as claimed in claim 1,
characterized in that
a metal complex is used as a labelling group which contains a structure of the general formula (I):

$$[M(L_1L_2L_3)]_n\text{-}Y_m\text{-} \qquad (I)$$

in which M is a divalent or trivalent metal cation selected from rare earth or transition metal cations,
L_1, L_2 and L_3 are the same or different and denote ligands containing at least two nitrogen-containing heterocycles, where L_1, L_2 and L_3 are bound to the metal cation by nitrogen atoms,
Y denotes a linker bound to one of the ligands,
m is an integer from 1 to 10 and
n is an integer from 1 to 6.

3. Method as claimed in claim 1 or 2,
characterized in that
a ruthenium complex is used as the metal complex.

4. Method as claimed in one of the claims 1 to 3,
characterized in that
the ligands of the metal complex are selected from bipyridine or phenanthroline ring systems.

5. Method as claimed in one of the claims 1 to 4,
characterized in that
the metal complex contains at least one hydrophilic group or/and a charge carrier.

6. Method as claimed in one of the claims 1 to 5,
characterized in that
the metal complex is used as a conjugate with a detection reagent for the analyte.

7. Method as claimed in one of the claims 1 to 6,
characterized in that
the detection is carried out as a homogeneous test.

8. Method as claimed in one of the claims 1 to 6,
characterized in that
the detection is carried out as a heterogeneous test.

9. Method as claimed in one of the claims 1 to 8,
characterized in that
the metal complex is oxidized electrochemically.

10. Method as claimed in claim 9,
characterized in that
the oxidation takes place by applying an anodic potential of at least + 1.2 V (relative to an Ag/AgCl reference electrode).

11. Method as claimed in one of the claims 1 to 8,
characterized in that
the metal complex is oxidized chemically.

12. Method as claimed in claim 11,
characterized in that
it is oxidized by PbO_2, permanganate, Cer^{4+} compounds or/and peroxodisulfate.

13. Method as claimed in one of the claims 1 to 12,
characterized in that
the reduction is separated spatially or/and in time from the oxidation.

14. Method as claimed in one of the claims 1 to 13,
characterized in that
the nascent hydrogen is generated in the direct vicinity of the metal complex.

15. Method as claimed in one of the claims 1 to 14,
characterized in that
the nascent hydrogen is generated electrochemically.

16. Method as claimed in claim 15,
characterized in that
the electrochemical generation is carried out by applying a voltage of $\leq$ -1.0 V relative to an Ag/AgCl reference electrode.

17. Method as claimed in one of the claims 1 to 14,
characterized in that
the nascent hydrogen is generated chemically.

18. Method as claimed in claim 17,
characterized in that
it is chemically generated by Li/butanol/H_2SO_4, Zn-Cu/ethanol or Zn/HCl.

19. Method as claimed in one of the claims 1 to 14,
characterized in that
the nascent hydrogen is generated by means of ultrasound.

20. Method as claimed in claim 19,
characterized in that
the generation by means of ultrasound takes place by abstraction of hydrogen radicals from organic compounds and in particular from alkyl compounds.

21. Method as claimed in one of the claims 1 to 8,
comprising a chemical oxidation of the metal complex and an electrochemical generation of the nascent hydrogen.

22. Method as claimed in one of the claims 1 to 21,
characterized in that
the oxidation and generation of nascent hydrogen take place in two separate reaction chambers.

23. Device for the detection of an analyte in a sample using a luminescent metal complex as a labelling group comprising:
(i) means for oxidizing the metal complex,
(ii) means for generating nascent hydrogen and

(iii) means for detecting chemiluminescence.

24. Device as claimed in claim 23,
characterized in that
the means (i) and (ii) comprise two separate reaction chambers.

25. Device as claimed in claim 23 or 24,
characterized in that
the means (i) are provided for the chemical oxidation of the metal complex.

26. Device as claimed in one of the claims 23 to 25,
characterized in that
the means (ii) are provided for the electrochemical generation of nascent hydrogen.

27. Method for generating chemiluminescence comprising the provision of a luminescent metal complex, oxidizing the metal complex and reducing the metal complex by nascent hydrogen to form a form of the metal complex that is capable of chemiluminescing.

28. Device for generating chemiluminescence comprising:
(i) means for oxidizing a luminescent metal complex and
(ii) means for generating nascent hydrogen.

New Claim 28

28. Use of a device comprising:

(i) means for oxidizing a luminescent metal complex and

(ii) means for generating nascent hydrogen

to generate chemiluminescence.